2 solid businesses +1 with blue sky

MGL has two solid businesses to which values can be fairly simply attributed and whose aggregate value is 20% above the current share price. The third business (the "+1") which makes up the remainder of our $0.53 per share valuation is currently loss making but with a pathway to profitability. If successful, this would transform the company and lead to a share valuation upwards of $1.40. The first of the two solid business, the Cathodic Corrosion Protection segment (Anodes), is a high market share, niche product sold into the white goods industry with solid earnings and strong cash flow ensuring there is no obvious need for additional equity.

Value underpinned by Anodes and Recycling

The Anodes business delivers steady-growth income from supply of niche components to global OEMs of water heaters. High market shares in China and Europe support earnings stability with growth options in the US. Magnesium alloy recycling, with its more than 40% share of supply to the European motor vehicle industry, does not report separately but has strategic value which we quantify with comparison to a 2019 sale of a similar business.

Chinese alloy plant awaits supplier restart

MGL has a primary magnesium alloy producer in Qinghai, China whose economics is reliant on the supply of magnesium from its adjacent producer, QSLM. Recent announcements about a restart of QSLM's operations provides hope that this business will fulfill its potential. MGL's Qinghai plant continues to operate at a loss with nominal output using expensive raw materials. QSLM owns 29% of MGL equity.

Green magnesium to drive future value

MGL's Qinghai alloy processing facility sits next to one of the few magnesium plants in the world (QSLM) that is capable of producing green magnesium. QSLM can produce magnesium with only 25% of the CO2 compared with nearly all other producers. As the drive to produce low-carbon products continues, we expect to see demand for "green" magnesium to grow and be reflected initially in valuations and ultimately in higher magnesium alloy prices.

Valuation

We value MGL at $0.53 per share composed of $0.41 being the sum of the parts of the two operating business (EV / EBITDA multiple for the Anodes and a transaction multiple for Recycling) and $0.12 for the Qinghai alloy plant based on it reaching 28% capacity utilisation. If Qinghai were to achieve 75% capacity utilisation, our valuation would increase to $1.44. Note that MGL is a processor of magnesium, so the recent price increase of the metal has no meaningful impact on our valuation but may add some volatility around near-term earnings.

MAGONTEC

Founded in 1953, MGL's operations involve the manufacture of magnesium anodes for corrosion protection in water heaters, and manufacture and recycling of magnesium alloys that are sold into the global auto industry. The Company has manufacturing facilities in Europe and China and sales those regions, as well as the US. Its primary alloy production facility in Qinghai, China is operating at a loss, awaiting the restart of its magnesium supplier. Once restarted, MGL will be one of the few suppliers of low-CO2 magnesium alloys.

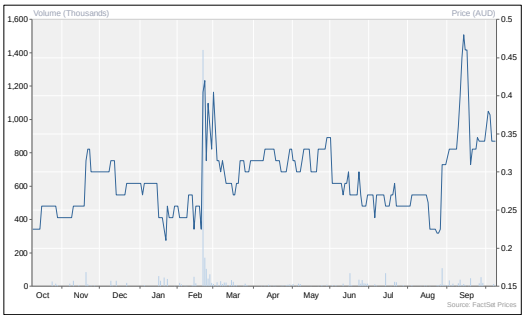
http://magontec.com/

Stock	MGL.ASX
Price	$0.34
Market cap	$26m
Valuation	$0.53

Valuation estimates (per share)	
Anodes	$0.28
Recycling	$0.13
MGL Qinghai	$0.12

Next steps
Restart of magnesium supply to its alloy production facility in China
Recovery of motor vehicle industry in Europe

MGL Share Price (A$)



Source: FactSet.

Andrew Johnston
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Figure 1 – Financial Summary

Magontec Limited (MGL-AU)

Year End 31 Dec		2019A	2020A	2021E	2022E	2023E
Core PE	x	nm	nm	15.9x	7.9x	3.9x
EV/EBIT	x	nm	112.1x	10.1x	5.3x	2.3x
EV/EBITDA	**x**	**15.2x**	**10.9x**	**5.4x**	**· 3.6x**	**1.9x**
Div yield	%	0.0%	0.0%	0.0%	0.0%	0.0%
FCF Yield	%	nm	1.1%	9.2%	16.0%	29.6%

Stock information		
Share Price	$	0.34
Market capitalisation	$m	26.1
Valuation	**$**	**0.53**
Shares on issue (Basic)	m	76.7
Shares on issue (diluted) (m)	m	82.1

Profit & Loss Statement	$m	2019A	2020A	2021E	2022E	2023E
Revenue		**130.6**	**95.1**	**106.4**	**119.7**	**134.5**
Change pcp	%		*-27.2%*	*11.9%*	*12.5%*	*12.4%*
EBITDA		**2.7**	**3.5**	**5.8**	**8.3**	**13.2**
margin	%	*2.1%*	*3.6%*	*5.5%*	*6.9%*	*9.8%*
EBIT		**-0.5**	**0.3**	**3.1**	**5.6**	**10.5**
margin	%	*-0.4%*	*0.4%*	*2.9%*	*4.6%*	*7.8%*
Net interest expense		-0.6	-0.6	-0.6	-0.6	-0.6
Profit Before Tax		**-1.1**	**-0.2**	**2.4**	**4.9**	**9.9**
Tax and adjustments		-0.3	-0.1	-0.7	-1.4	-2.8
NPAT (underlying)		**-1.3**	**-0.3**	**1.8**	**3.5**	**7.1**
Significant, discontinued et.al		0.0	-0.4	0.0	0.0	0.0
NPAT (reported)		-1.4	-0.7	1.8	3.5	7.1

	2H FY18	1H FY19	2H FY19	1H FY20	2H FY20	1H FY21
	65.3	**67.3**	**63.4**	**46.0**	**49.1**	**50.9**
		2.7%	*-3.0%*	*-31.6%*	*-22.5%*	*10.6%*
	2.5	**2.6**	**0.1**	**1.9**	**1.6**	**3.4**
	3.9%	*3.8%*	*0.2%*	*4.2%*	*3.2%*	*6.6%*

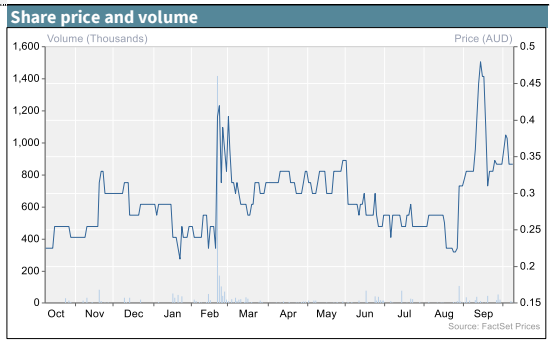
Performance ratios	2020A	2021E	2022E	2023E
ROE (%)	nm	5.8%	10.4%	17.3%
ROIC (%)	-0.4%	6.7%	11.2%	19.5%
Net debt/(Net debt + Eq	29%	14%	9%	-4%
Interest cover (EBITDA)	6.0x	9.1x	13.0x	20.8x
Capex/Depreciation	24%	40%	40%	40%
Days Working Capital	121	97	97	97

Per Share Data		2019A	2020A	2021E	2022E	2023E
Ave. diluted shares outstanding	m	82	82	82	82	82
Underlying EPS	**cps**	**-1.6**	**-0.4**	**2.1**	**4.3**	**8.6**
growth pcp	%		nm	nm	nm	100%
Reported EPS	cps	-1.7	-0.9	2.1	4.3	8.6
growth pcp	%		nm	nm	nm	100%
DPS	cps	0.0	0.0	0.0	0.0	0.0
Payout (on underlying)	%	0%	0%	0%	0%	0%

Segments	2020A	2021E	2022E	2023E
Revenue				
Anodes	31.4	43.2	43.5	46.0
Metals	63.7	63.2	76.2	88.6
Total Revenue	**95.1**	**106.4**	**119.7**	**134.5**
Gross Profit				
Anodes	8.2	10.6	11.8	13.2
Metals	4.0	4.1	5.4	8.9
Toptal Gross Profit	**12.2**	**14.7**	**17.2**	**22.1**
Gross Profit margin				
Anodes	26.1%	24.6%	27.2%	28.7%
Metals	6.3%	6.4%	7.0%	10.1%
Avg Segment margin	**12.8%**	**13.8%**	**14.4%**	**16.4%**
Overheads	-8.7	-8.9	-8.9	-8.9
EBITDA	**3.5**	**5.8**	**8.3**	**13.2**

Balance sheet	$m	2019A	2020A	2021E	2022E	2023E
Cash & Deposits		4	5	12	13	18
Receivables		26	22	18	20	23
Inventory		25	22	24	27	31
PP&E (incl right of use assets)		22	19	18	16	14
Intangibles		4	3	3	3	3
Other Assets		3	3	3	3	3
Total Assets		**84**	**75**	**78**	**83**	**92**
Payables		17	13	14	16	18
Borrowings		20	17	17	17	17
Provisions / other (incl. Lease Liab.)		16	17	17	17	17
Total Liabilities		**53**	**46**	**48**	**49**	**51**
Shareholders' Funds		**31**	**29**	**30**	**34**	**41**
Net Debt		**15**	**12**	**5**	**3**	**-1**

Share price and volume



Cashflow statement	$m	2019A	2020A	2021E	2022E	2023E
EBITDA		2.7	3.5	5.8	8.3	13.2
Net interest		-0.6	-0.6	-0.6	-0.6	-0.6
Tax paid		-0.3	-0.5	-0.7	-1.4	-2.8
Working capital movements		-9.9	1.4	3.1	-3.5	-4.0
Other		-0.1	0.7	0.0	0.0	0.0
Operating CF		**-8.1**	**4.5**	**7.6**	**2.7**	**5.8**
Capital expenditure		-1.9	-0.7	-1.0	-1.0	-1.0
Asset sales		0.0	0.0	0.0	0.0	0.0
Acquisitions		0.0	0.0	0.0	0.0	0.0
Other		-0.4	-0.4	0.0	0.0	0.0
Investing CF		**-2.4**	**-1.1**	**-1.0**	**-1.0**	**-1.0**
Net borrowings		1.9	-2.8	0.0	0.0	0.0
Dividends paid		0.0	0.0	0.0	0.0	0.0
New share issues		0.0	0.0	0.0	0.0	0.0
Financing CF		**1.9**	**-2.8**	**0.0**	**0.0**	**0.0**
Net change in cash		**-8.6**	**0.7**	**6.6**	**1.7**	**4.9**

Note: accounts are post-AASB 16; Right of use assets = ~3% of PP&E

Company description

Founded in 1953, MGL's operations involve the manufacture of magnesium anodes for corrosion protection in water heaters, and manufacture and recycling of magnesium alloys that are sold predominantly into the auto industry. The Company has manufacturing facilities in Europe and China. It has sales in those regions, as well as the US. Its primary alloy production facility in Qinghai, China is operating at a loss, awaiting the restart of its magnesium supplier. Once this supply has restarted, MGL will be one of the few suppliers of low-CO2 magnesium alloys.

Source: Company, MST Access

Investment Thesis – 2 solid businesses + 1 with the upside

MGL operates three magnesium processing businesses with processing plants based in China and Europe. The Cathodic Corrosion Protection (Anodes) segment produces anodes for residential and commercial water heaters in China and Europe which are sold to original equipment manufacturers (OEMs) in China, Europe and the US. The Metals segment has two elements: a magnesium alloy Recycling business in Europe whose customers are motor vehicle manufacturers and Tier 1 suppliers; and a magnesium alloy production business in Qinghai, China sited next to a magnesium plant (QSLM) from which it will receive molten magnesium once this plant restarts. This plant halted production in late 2019, and it is expected to restart supplying molten magnesium to MGL's Qinghai facility in 2022.

From a valuation perspective, we consider MGL in three parts: Anodes, Recycling and Qinghai.

Anodes and Recycling – values underpin the current share price

The Anodes business produces traditional magnesium anodes and electronic anodes that are used in water heaters to prevent corrosion. Revenue and earnings show solid stable growth over the past 5 years with MGL having high market share in what is a niche sector. This is a stand-alone business and we have therefore valued it separately on an EV/EBITDA basis using the average multiple of comparable companies discounted by 30%.

The Recycling business does not report separately, but its high market share as an important supplier to the European and North American markets gives it strategic value. We estimate its value based on the price achieved in 2019 on a capacity based multiple for a smaller but similar business.

Qinghai – serious upside but out of MGL's control

MGL's Qinghai magnesium alloy cast house was designed to be supplied molten magnesium by Qinghai Salt Lake Magnesium Co. Ltd (QSLM). The business is currently loss-making as MGL is sourcing a nominal amount of high cost magnesium to ensure at least some of its customers continued to get supplied. QSLM has announced that it will be restarting operations in 2022 with ramp up expected over subsequent months.

Valuation

We have estimated a valuation of MGL of $0.53 per share on a sum of the parts methodology.

Figure 2 – Sum of the parts valuation estimate

Business	Valuation methodology	EV ($m)	Net Debt ($m)	Equity val. ($m)	per share ($)
Anodes	EV / EBITDA multiple (disc comps)	28.0	5.1	22.9	$0.28
Recycling	Capacity multiple (recent txn)	11.0		11.0	$0.13
Total	**(fully operating busineses)**	**39.0**	**5.1**	**33.9**	**$0.41**
Qinghai	EV / EBITDA at 28% capacity util.	10.0		10.0	$0.12
TOTAL		**49.0**	5.1	43.9	**$0.53**

Source: MST Access

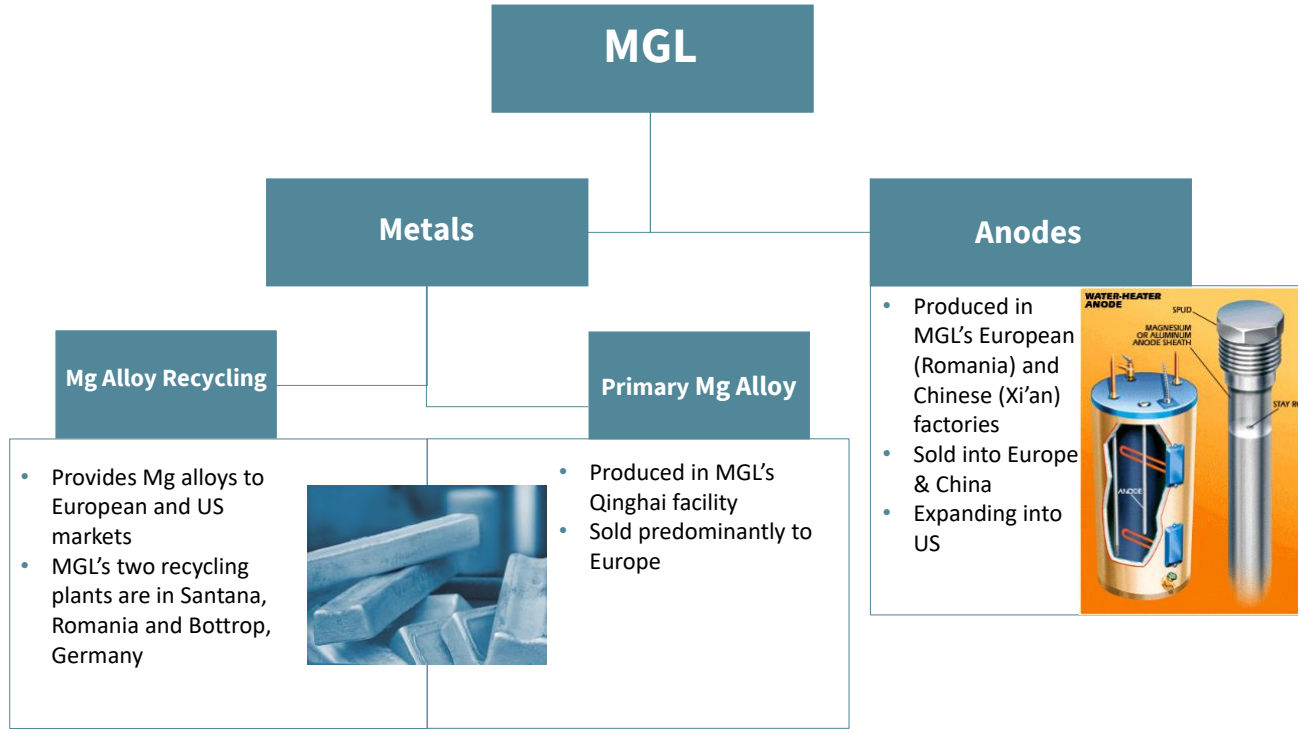
Qinghai is the source of substantial upside but is wholly dependent on the supply of molten magnesium from QSLM. Should MGL's Qinghai plant achieve 75% capacity utilisation (based on product from QSLM), this would add a further $0.90 per share to our valuation and taking it to $1.44.

We are not aware of the details of the supply and access contract between QSLM and MGL and the potential scenarios should QSLM not meet its contractual obligations to supply magnesium metal to MGL Qinghai's alloy production facility. We note that QSLM has a 29% stake in MGL, but we are not aware of a link between that and QSLM's agreements with MGL.

Company Overview

MGL contains two reporting segments; Cathodic Corrosion Protection (which we refer to as Anodes) and Metals, in which magnesium remains central to all operations. MGL manufacturers both magnesium and electric anodes within its Anodes business. Within the metals segment, MGL operates a magnesium alloy recycling business (Recycling) and a primary magnesium alloy manufacturing business (MGL Qinghai).

Figure 3 – Company Summary



Source: Company, Popular Mechanics

1. Anodes (Cathodic Corrosion Protection)

MGL is the world's leading manufacturer of magnesium and electronic anodes for Cathodic Corrosion Protection. This segment produces magnesium anodes that are included in the manufacture of water heaters. Known as sacrificial anodes, they gradually erode away due to electrolysis that occurs between the different metals inside a water heater which slows corrosion of the water heater. The Company controls all production processes from sourcing the raw material to casting or extruding of magnesium anodes, and manufacture of electronic anodes. MGL's Romanian and Xi'an factories manufacture magnesium anodes while electronic anodes are manufactured in MGL's German factory. Anodes are sold into Europe and China with the Company also expanding into the US. Due to the essential nature of the product, the anode industry has been relatively stable throughout the pandemic.

2. Metals

Within MGL's Metal's segment there are two businesses: magnesium alloy recycling and primary magnesium alloy manufacturing. The Company's recycling division operates two recycling plants in Romania and Germany and provides magnesium alloys to the European and US auto industry. MGL's primary magnesium alloy manufacturing business operates out of Qinghai, China and its products are currently sold in China, Japan and other countries in Asia.

MGL's metals businesses have a strong relationship as the recycling business benefits from its customers having access to primary magnesium alloys from Qinghai as well as recycled product. When the MGL Qinghai facility can run at increased capacity and supply into Europe, it will bring significant upside to the Recycling business. Given earnings are not separated between Qinghai and Recycling, it is not possible to make assumptions around profitability of each business.

Primary magnesium alloy manufacturing

MGL's magnesium alloy manufacturing business originally started in 2002 in Xi'an and moved to Shanxi Province in 2012. This plant was closed in 2018 when the Qinghai plant was opened, with molten magnesium supplied from the adjacent QSLM magnesium plant. However, a range of issues forced the closure of QSLM in 2019. QSLM has announced that it expects to restart production (and supply to MGL) before June 2022. Work to remediate and re-start one of six dehydration lines at Qinghai is currently underway however we remain cautious on the timing of its commissioning. Each dehydration line has sufficient capacity to allow production of 16,600 tonnes of magnesium metal. In FY20, MGL produced just 5,815 tonnes of magnesium alloy and sourced all raw material from third parties in other provinces. With the total cast house capacity at 60,000 tpa of magnesium alloys, the recommencement of raw material supply to the MGL cast house from just one dehydration unit would transform the economics of the entire business unit. Refer to Valuation section for estimates of the economics of this business.

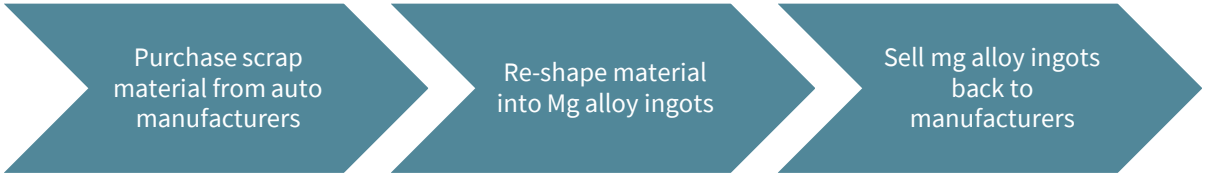
Once operations at Qinghai commence, MGL will have the lowest CO2 emissions of any magnesium alloy producer in the world. High start-up costs of magnesium production remove the threat to MGL of competitors entering the market in attempt to meet expected demand for green magnesium.

Magnesium alloy recycling

The recycling business model involves purchasing scrap magnesium alloy material from auto manufacturers, re-shaping the material into a 6-12`kg magnesium ingots, then selling the magnesium alloy ingots back to the manufacturers. Note that MGL's recycling plants use electric arc furnaces to melt the scrap, in comparison with most in the industry using gas. This gives MGL the option of easily using "green" electricity to process the scrap contributing to its ability to provide low-CO2 magnesium.

MGL's recycling division was producing high volumes and revenue prior to the outbreak of CV-19. The pandemic devastated the automotive industry and consequently affected MGL's recycling businesses. Also, the shutdown of the Qinghai facility affected the recycling business, given that there is a relationship between the supply of primary magnesium alloys with supply of recycled product.

Figure 4 – Magnesium alloy recycling business model



Source: MST Access

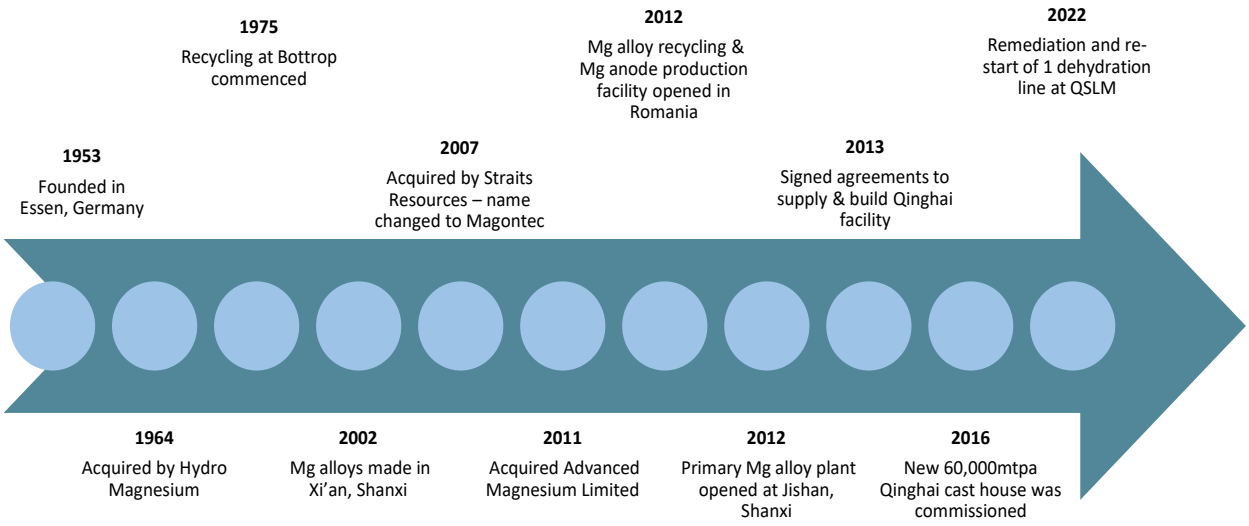
Company Locations

MGL is based in Sydney, Australia with operations in the following locations:

- Bottrop, Germany: Production of electronic anodes and recycling; Sales office and Technology centre
- Santana, Romania: Production of magnesium anodes and recycling
- Xi'an, China: Production of magnesium anodes; Sales office and Technology centre
- Qinghai, China: Production of primary magnesium alloys
- Tokyo, Japan: Sales office
- Sydney, Australia: Headquarters; and Technology centre

Company History

Figure 5 – MGL timeline



Source: Company

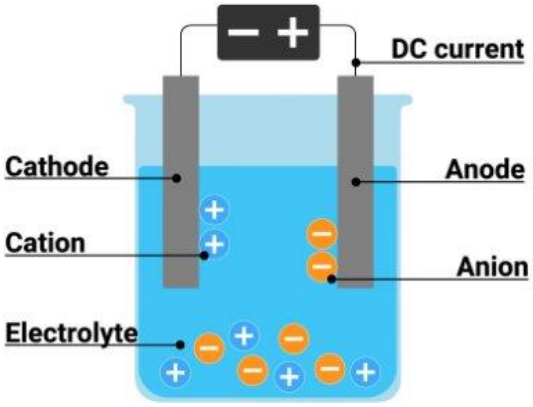
Recent Announcements:

- 22 July 2021: QSLM has engaged an engineering company to carry out the remediation with plans to re-start one of the dehydration lines at QSLM electrolytic smelter in 2022.

Anodes

The Anodes segment (Cathodic Corrosion Protection segment) manufactures anodes that are used in water heaters to reduce corrosion. Anodes extend the life of metal products that come into frequent contact with water e.g., ships, pipelines, boilers, hot water storage tanks. Anodes prevent corrosion (electrolysis) from occurring in these products through sacrificially corroding.

Figure 6 – Electrolysis process



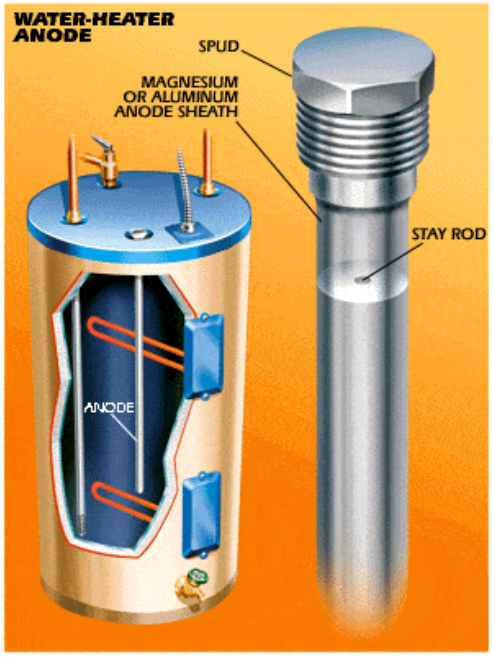
Source: ProProfs

MGL supplies magnesium and electronic anodes for water heaters under brand names including HyTonic® Anodes, Correx® Impressed Current Systems, CorroScout® Measuring Systems and S-Patron® Intelligent Measuring and Control Systems.

Magnesium anodes

All hot water systems contain at least one anode to prevent corrosion from occurring. In most domestic water heaters, the anodes are simple magnesium rods.

Figure 7 – Water-Heater Anode rod



Source: Popular Mechanics

Magnesium anodes effectively prevent corrosion in water heater tanks as weaker metals are always attacked by corrosion first. Sacrificial anodes function through an anodic-cathodic reaction as ions flow from anode to steel, protecting the latter while the anode rod is slowly corroded[1]. When the rod has been completely corroded, the tank starts to rust. The majority of hot water tanks also have corrosion prevention coatings preventing corrosion from occurring to the tanks for a short period even after the anode has been completely corroded.

Figure 8 – Sacrificial anode: New vs. Corroded

Source: The Plumbing & Electrical Doctor

MGL has magnesium anode manufacturing facilities in Romania, and Xi'an. The Romanian plant only manufactures cast anodes, whereas Xi'an manufacturers both cast and extruded with demand for each determined by different markets.

Electronic anodes

Electronic anodes are a lot more durable and more efficient than conventional magnesium anodes. They work in a similar way to magnesium anodes, however, the ions come from an AC outlet instead of a sacrificial reaction. MGL's electronic anodes have a 25-year guarantee. While ~10x more expensive than magnesium anodes, at EUR50 – 100 per unit, the cost remains small – particularly for high end domestic and industrial water heaters.

All electronic anodes are made in MGL's plant in Germany with sales to European and US manufacturers of high end domestic and industrial water heaters. They consist of a titanium rod, a circuit board, and components to connect into a power supply.

Competitive landscape

The anode manufacture market is relatively competitive. However, MGL has established itself as an industry leader. MGL believes it has ~30% market share in China for anodes with 10-15 competitors, and in Europe, 30-35% market share for magnesium anodes, and a substantial share of the market for electronic anodes with ~4 competitors.

The Chinese market is far more competitive than Europe, compounded by there being only four major customers for water heaters in China. The competitiveness of the Chinese market means that there is a delay in passing through increases in magnesium prices (magnesium accounts for ~40% of the cost of a magnesium anode). Contracts are re-bid each six months. By comparison, changes in magnesium prices are passed through relatively quickly in Europe.

The numbers

We have estimated the breakdown of sales between magnesium and electronic anodes across Europe and China. The margins within the magnesium anode business are best understood as a conversion margin per tonne of magnesium anodes produced.

[1] Waterheaterrescue

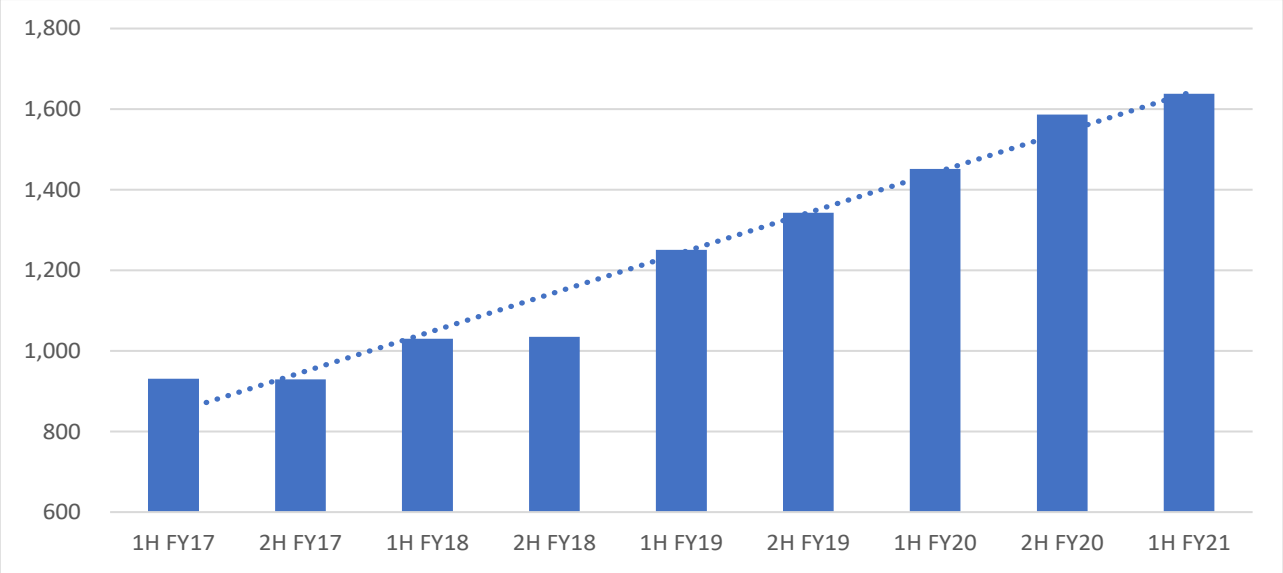
Figure 9 – Magnesium & Electronic Anode Comparison

Benchmark	Magnesium Anodes	Electronic Anodes
Use (water heaters)	Consumer	High-end consumer and industrial
Cost	~EUR6	~EUR50-100
FY20 (Eur)	EUR5.0m (840 t)	EUR5.5m
FY20 (China)	RMB71m (220 t)	
Gross margin	26%	

Source: MST Access

Since 1H 2017 to the latest half year, magnesium anodes, measured in weight of magnesium has increased at a compound rate of 13%.

Figure 10 – Magnesium anodes sold (tonnes) CAGR = 13% pa (4½ year CAGR)

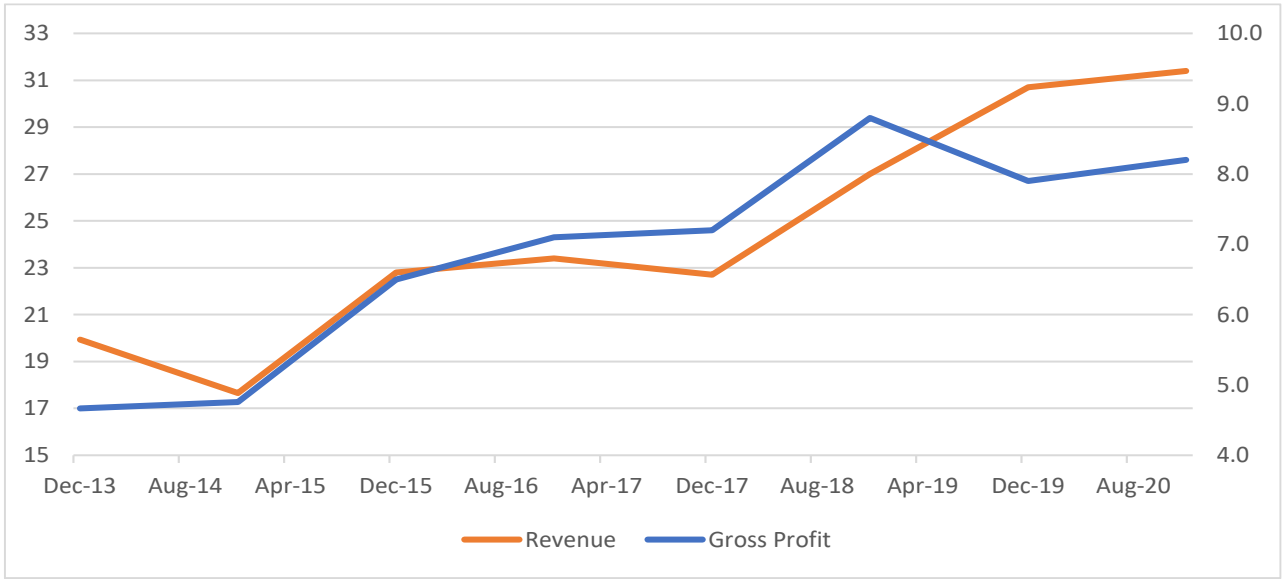


Source: Company, MST Access

Revenue and gross profit for the whole Anodes segment – which includes both magnesium and electronic anodes - in the seven years to 31 December 2020, have grown at compound rates of 6.7% and 8.4% respectively.

Revenue from this segment demonstrates a relatively high level of stability and steady growth particularly when considered over 2 or more years.

Figure 11 – Anodes segment (A$m)



Source: Company

While it is difficult to draw definitive conclusions from the data given the complexity of the business that includes electronic anodes, the magnesium anode part of the business is best understood as a conversion margin based on the volumes of anodes produced. Consequently, one should expect that in periods where magnesium prices rise sharply, revenues will increase but percentage margins are likely to decline.

Figure 12 – Anode business historical and forecast estimates of revenue and EBITDA

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E
Magnesium price (USD)	2,181	2,481	2,289	1,952	4,000	3,000	2,500	2,250	2,250	2,250
Magnesium anode volumes (t)	1,860	2,065	2,594	3,038	3,403	3,811	4,268	4,780	5,354	5,996
... growth	*0%*	*11%*	*26%*	*17%*	*12%*	*12%*	*12%*	*12%*	*12%*	*12%*
Revenue (incl Mg and electronic anodes)	**22.7**	**27.0**	**30.7**	**31.4**	**43.2**	**43.5**	**46.0**	**49.6**	**55.4**	**61.3**
... growth		*19%*	*14%*	*2%*	*38%*	*1%*	*6%*	*8%*	*12%*	*11%*
Gross Profit	7.2	8.8	7.9	8.2	10.6	11.8	13.2	14.7	16.5	18.2
....GPM	*32%*	*33%*	*26%*	*26%*	*25%*	*27%*	*29%*	*30%*	*30%*	*30%*
Overheads	-4.4	-5.1	-5.4	-4.9	-5.8	-5.8	-5.8	-5.8	-5.8	-5.8
EBITDA	**2.8**	**3.7**	**2.5**	**3.3**	**4.8**	**6.0**	**7.4**	**8.9**	**10.7**	**12.4**

Source: Company, MST Access

Recent performance and FY21 outlook

First half performance of the Anodes business was strong, with gross profit up more than 50% on pcp. There does not appear to be any consistent seasonality evident between first and second half earnings. The sharp rise in the magnesium price adds to the risk around second half earnings (both to the upside and the downside) given the timing of passing through raw material prices changes (This is based on timing of contracts and competitive nature of some markets.) We have assumed 2H FY21 earnings will be below 1H FY21.

Figure 13 – Anode segment – half year earnings

($m)	1H FY18	2H FY18	1H FY19	2H FY19	1H FY20	2H FY20	1H FY21	2H FY21e
Revenue	13.7	9.0	16.4	14.3	15.8	15.6	18.7	18.1
Gross Profit	4.5	4.3	5.2	2.7	3.6	4.6	5.7	4.9
... change (pcp)			*15.6%*	*-37.2%*	*-30.8%*	*70.4%*	*58.3%*	*7.5%*

Source: Company, MST Access

Growth Outlook

MGL produces magnesium anodes for the Chinese, European and US markets, and electronic anodes for the European and US markets. Management is focusing on expanding into the biggest market of them all, the US where it has only a small market share. MGL believes that its strategy to grow into the US market will double sales volume in coming years.

It is estimated that 80% of anodes are sold to OEM's that are producing replacement water heaters, mostly required because the magnesium anodes have been consumed by electrolysis causing the water heater to corrode. Magnesium anodes last between 2 and 10 years depending on the mineral content of the water with the water heater typically failing within 2-3 years after the anode has been consumed. Electronic anodes last approximately 25 years.

While electronic anodes can extend the life of a water heater by 5-10 years, the high costs of the product, and failure of consumers to recognise the value of the extended life of a water heater, means that electronic anodes are used only in high end domestic and industrial water heaters.

We expect that increased focus on sustainability and addressing what appears to be planned obsolescence in the domestic water heater industry is likely to lead to above market demand for electronic anodes – although we don't explicitly forecast such a scenario.

Magnesium alloy recycling

The magnesium alloy recycling industry is an established industry that has experienced significant growth over the last twenty years. MGL's recycling is based in Europe with plants in Romania and Germany with an aggregate recycling capacity of 20,000 tpa giving it a significant share of the market. MGL essentially earns a conversion margin on the volume of product recycled.

Customers

Car manufacturers remain the most important customer for MGL within this business segment. Car manufacturers sell scrap material to magnesium alloy recyclers and once the scrap material is transformed into ingots, it is then re-sold back to the car manufacturers. The automotive industry dominates the share of end users for this product followed by the power tool industry, and thirdly the electronics industry. As well as selling into the European market, it also sells product to the US which is effectively constrained from purchasing primary magnesium because of the ~140% tariffs on Chinese magnesium.

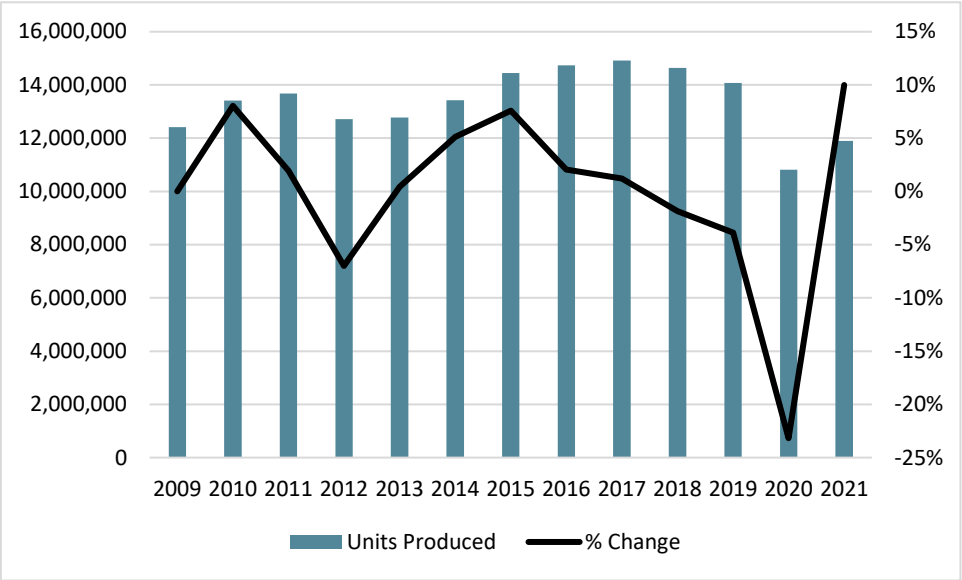
Competitive Landscape

The industry is highly competitive notwithstanding a limited number of players. MGL is no exception. We understand that profitability is linked to the supply of primary magnesium alloys and so MGL's very limited supply of primary product is impacting profitability of this business.

European Automotive Industry

2020 saw the industry take a considerable hit due to the effects of the COVID-19 pandemic. 2020 EU passenger car production was down 23.3% to 10,810,265. However, the market is expected to recover promptly from the pandemic, especially in 2H 2021, where production is expected to increase 10% compared to last year.

Figure 14 – EU Automotive Production



Source: ACEA

Qinghai – supplier restart provides the upside

Part of MGL's Metals segment is a magnesium alloy producer in Qinghai, China whose economics are reliant on the supply of magnesium from its adjacent producer, QSLM. Recent announcements about a restart of its operations provides hope that this business will fulfill its potential. While continuing to operate at nominal capacity with expensive raw materials, MGL's Qinghai plant has maintained a small level of production but operates at a loss. As well as being MGL Qinghai's only economic supplier of magnesium, QSLM owns 29% of MGL equity.

In FY20 MGL produced less than 6,000 tonnes of magnesium alloys (capacity of 60,000 tonnes) contributing to the loss in the Metals segment. This was due to the lack of supply from QSLM requiring MGL to transport magnesium ingots by truck from up to 1000km away. MGL continued to maintain operations, notwithstanding the losses as it maintains at least some sales to its customers in China, Japan and other Asian countries.

Primary magnesium alloy – Qinghai operations

MGL produces magnesium alloys in its plant located in Qinghai, China. These alloys are between 90-95% magnesium alloyed with other metals such as aluminium, manganese and zinc. A range of rare earth metals such as lanthanum and cerium are also used to enhance creep resistance, improving performance in casting and in its end-use. Most of MGL's magnesium alloys are generic magnesium aluminium alloys that are supplied to die-casters in Asia, Europe and the North America that end up in the auto industry. It also produces a range of specialty alloys for other industries including aerospace, industrial and commercial.

In Qinghai, MGL has a 10-year exclusive right (with an option for a further 10 years) to produce alloys at a cast house that sits adjacent to a magnesium production facility owned by its partner company, QSLM. The start of this exclusive 10-year period has not been triggered yet and will begin on Commercial Production, defined as delivery of 13,000 tonnes of annualised supply of qualified material in any one month. MGL Qinghai is designed to take molten magnesium directly into the cast house where a variety of magnesium alloys are produced. The price of magnesium is linked to the global price, with adjustments for transport and other costs ensures that MGL earnings are based on the tonnes produced, not the price of magnesium.

MGL's Qinghai cast house has annual capacity of 60,000 tpa, requiring ~56,000 tpa of magnesium metal. QSLM has total capacity of 100k tpa of magnesium metal production based around six dehydration units – each with 16k tpa of capacity. QSLM has never operated effectively, with its parent's financial difficulties ensuring that commissioning was never completed.

Magnesium from QSLM is produced via the electrolysis process with the electricity sourced from ~85% renewable sources. This ensures that the alloys produced by MGL Qinghai are some of the "lowest CO2" magnesium alloys produced anywhere in the world.

Unfortunately, since the second quarter of 2019, MGL Qinghai has been forced to source alternative suppliers of magnesium as a result of a halt in operations at the QSLM facility. Given the high cost of the alternative supply, MGL Qinghai has lost money in each of the reporting periods since Q2 2019.

Management believes that the PRC Government is supportive of the Qinghai project. GL's established key relationships, strong distribution network, and operational expertise demonstrate the potential for long-term operations at this facility.

Why Qinghai stopped in the first place

A combination of management, financial and operational issues forced QSLM to shut down. A review of the facility's history depicts three core factors that are responsible for the closure of the QSLM facility:

1. Financial instability of its owner – Qinghai Salt Lake Industry Co Ltd (QSLIC)
2. Issues with the dehydration process
3. Issues with the transportation trucks

QSLIC had incurred a substantial amount of debt and threatened with removal from the Shenzhen stock exchange following two consecutive periods of losses. In response, QSLIC stopped funding the commissioning of QSLM and triggered its shut down. Since then, there has been ongoing delays with the restructuring process.

In terms of operational problems at QSLM, the facility encountered significant bottleneck issues with the dehydration process and the logistics involved with the transportation trucks. At least part of the problems arose from the use of vacuum processes that are less effective at Qinghai's 2,800m altitude.

Within the dehydration process, too much nickel was included in the alloys. It is believed that the nickel was coming from the brine or being scraped off the pipes, ultimately diminishing the quality of the final product (magnesium alloys).

Figure 15 – Timeline of QSLM (supplier to MGL's Qinghai alloy production facility)

Date	Event
18/04/2018	MGL's cast house at Golmud, Qinghai was officially opened
31/03/2019	QSLM was shut down as QSLIC were unable to continue funding the commissioning
12/04/2019	MGL Qinghai utilised QSLM's inventory stockpile whilst sourcing alternative supply
31/06/2019	QSLM appointed an experienced Chinese engineering company to conduct a review
1H 2019	MGL's Qinghai business unit was loss making and incurred depreciation of $651,000 for the period
16/09/2019	Court approved an application to restructure QSLM and appointed a manager for that process
16/12/2019	As part of the restructure, QSLIC sold its 88% share in QSLM to Qinghai Huixin Asset Management (QHAM)
16/12/2019	At this stage MGL Qinghai was outsourcing all raw materials, operating at <10% capacity and losing money
18/03/2021	Plans announced to recommence production from 1 of the 6 dehydration lines at QSLM
22/07/2021	Chairman of QHAM announced it had engaged an engineering company to carry out the remediation and re-start of one (of six) dehydration lines at QSLM targetting restart in 1H 2022.

Source: Company

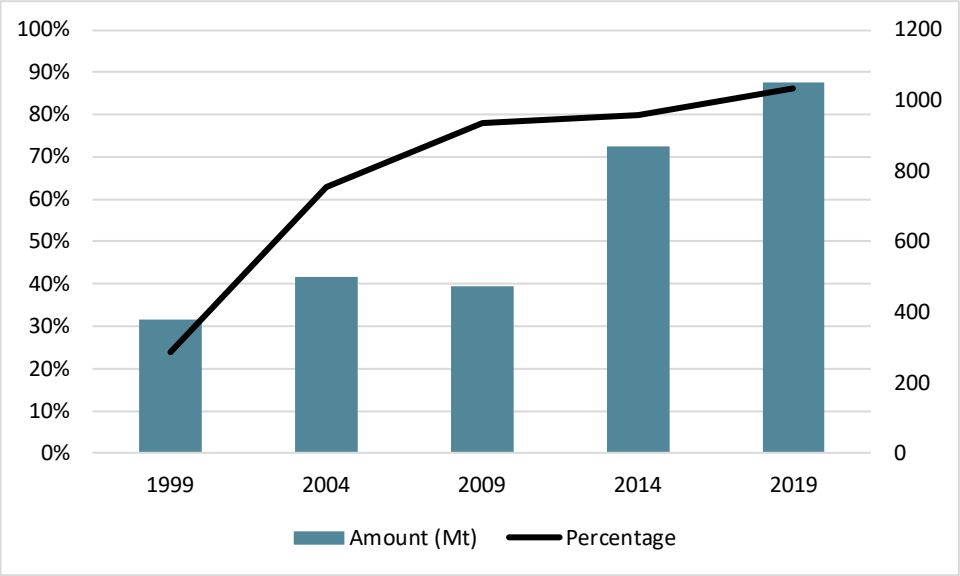
Magnesium industry

MGL Qinghai's long term value relies on its access to low cost, "low CO2" magnesium. While MGL is a processor of magnesium, an understanding the broader magnesium industry remains important.

The production of primary magnesium is an industry now dominated by Chinese manufacturers. The increase of Chinese magnesium production over the past 10 years is the result of favourable operating conditions comprising low investment cost, low labour cost, and a lack of environmental standards (Baker P.W., 2016). Non-China magnesium

manufacturers could not compete and were closed. China now supplies 82% of the worlds demand for primary magnesium (CM, 2021).

Figure 16 – China's share of global primary magnesium supply



Source: CM 2020

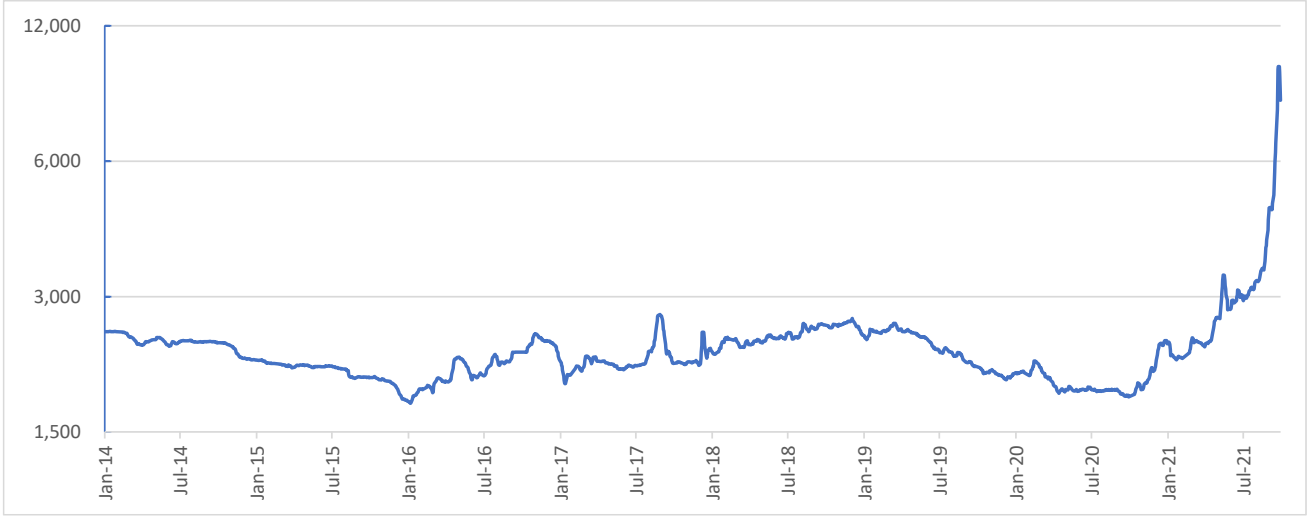
Magnesium price movements and its implications

As previously discussed, the best way to think about how MGL Qinghai makes money is that it earns profit based on the amount of product processed. The price it pays QSLM for magnesium is based on the global magnesium price adjusted for freight given the plant's geographic isolation.

The competitive nature of both the recycling and the anodes industries means that higher magnesium prices are passed through to customers leaving MGL with a fee based more on the volume product converted or processed than the price of magnesium. The delay in passing the price changes through to customers varies by region and by product reflecting the competitiveness of local industries.

It is difficult to estimate the immediate short term effect of the recent spike in the price of magnesium. There is the possibility that there may be pressure on near-term earnings given the delay in passing through higher prices. Working capital will likely increase markedly should current prices be sustained into year end.

Figure 17 – Mg price (USD / tonne)



Source: Company

Production processes: Electrolysis & Pidgeon

There are two ways that magnesium is produced: electrolysis and the Pidgeon process. Electrolysis has dominated the global primary magnesium supply base prior to 1999.

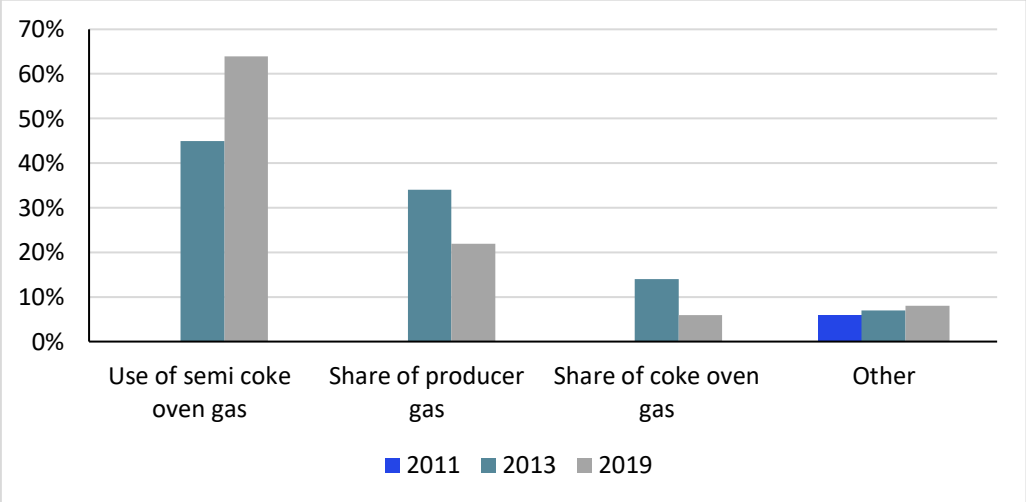
In the 1990's China emerged as a cost leader through its use of the Pidgeon process. This process gained rapid traction and as a result, China has dominated the supply base for over two decades. China maintains its dominant position today, as it is responsible for more than 80% of global supply (CM, 2021). The ability for China to leverage low investment costs, low labour costs, and minimal environmental standards ensured that the Pidgeon process was a cost-leader (Baker P.W., 2016). Depending on the source of electricity, electrolysis can be the cleaner process. However, higher operational costs have prevented this process from being used in the past. QSLM uses electrolysis and sources electricity from a variety of mostly renewable sources, including; hydro (63.8%), solar (17.9%), thermal (15.3%), and wind (3%).

Pidgeon process for the production of magnesium metal

This process relies on extracting magnesium oxide (MgO2) from raw materials such as dolomite and then using silicon in the form of ferrosilicon alloy to separate the magnesium from magnesium oxide. The process produces CO2 in the initial step of extracting MgO2 from the dolomite with around 47% of dolomite decomposing into CO_2 gas, which is discharged into the air. It uses a substantial amount of energy in extracting the magnesium metal. (Wu L., et al., 2021). The source of energy for this step can come from a variety of sources, but coking oven gas (from coal) is now the most common source.

The CM Groups' (www.cmgroup.net) survey on energy consumption of the Pidgeon process represents the state of Pidgeon process in 2019. By comparing CM Group's 2019 data to the 2013 LCA study, one can observe that the use of semi coke oven gas has increased from 45% to 64%. The relative share of the overall amount of magnesium produced from non-coal sources of energy remains constant at a low level of 8% (compared to 6% in 2011), despite the increase in magnesium produced from natural gas from 43 kt in 2011 to 75 kt in 2019.

Figure 18 – 2019 vs. 2013/2011 Pidgeon energy source

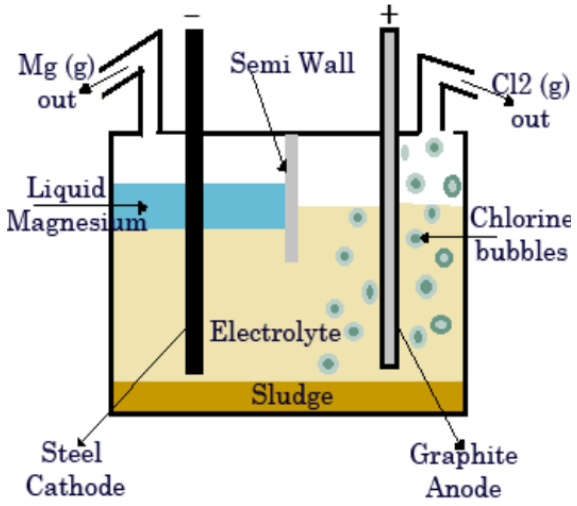


Source: CM Group & LCA

Electrolysis process of magnesium production

Magnesium metal is produced by the electrolysis process from magnesium chloride brine which is typically sourced from salt lakes or sea water. For QSLM, magnesium chloride brine is a waste product of a nearby potash plant. The brine is first dehydrated and purified, and it is then rehydrated to become the electrolyte in the electrolysis process.

Figure 19 – Electrolysis of magnesium chloride to create magnesium metal



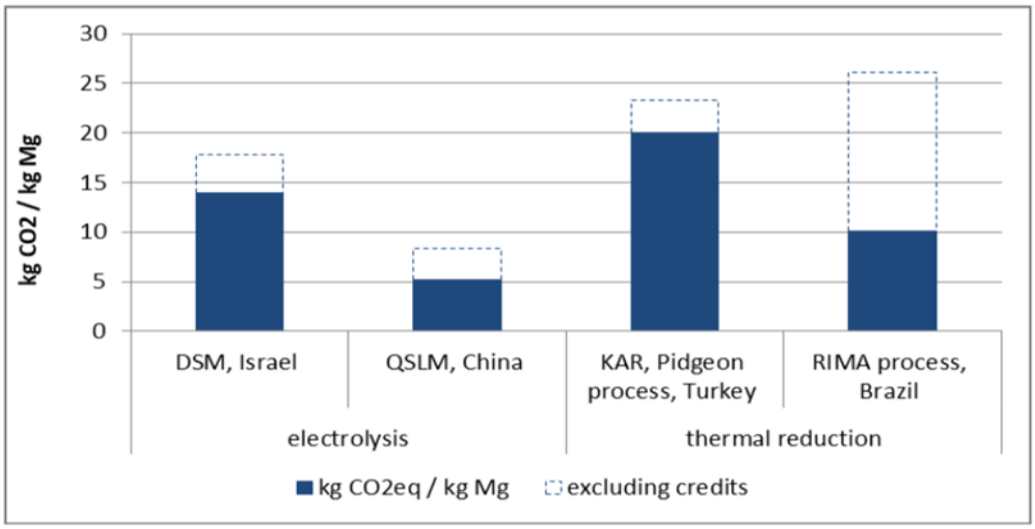
Source: Great Mining

Gaseous magnesium is condensed into liquid and in the case of QSLM delivered by truck as molten metal to MGL's magnesium alloy cast plant. The chlorine gas is used in an adjacent ethylene production plant. The electrolysis process uses electricity to provide the energy to separate the magnesium chloride.

Electrolysis vs Pidgeon process for magnesium production

While Chinese Pidgeon processes have improved over 7 years, it remains the most CO2 intensive of the industrial magnesium production processes. Chinese Pidgeon process averages at about 20 kg of CO2 / kg of magnesium – similar to the Turkish Pidgeon process. This compares with QSLM process which produces about one quarter as much CO2 / kg of magnesium produced.

Figure 20 – Greenhouse gas emissions of industrialised magnesium production sites



Source: IMA LCA Study 2020

We expect that we will see an increase in magnesium production outside of China that will use the electrolysis process and renewable energy. However, this will be high-cost magnesium, and with premiums for green magnesium not yet being paid, any further green magnesium production is likely to be many years away.

Competitive Landscape

The primary magnesium alloy production industry features significant barriers to entry with extremely high start-up costs. MGL is of the view that it will be difficult for any new low-CO2 plants to compete with it on price given its competitively priced source of magnesium.

However, competition between the magnesium industry's existing players has recently ramped up. China's industry is competitively structured with the top eight producers' representing only 26% of supply[2]. Chinese manufacturers have remained the world's lowest cost (albeit high CO2) producers[3]. RSM (Yunhai) is the largest magnesium producer in China, operating two Pidgeon smelters in Shanxi and Anhui, with a combined capacity of approximately 75ktpa[3]. However, MGL retains a competitive advantage due to its proximity to China's only electrolysis-based magnesium production plant that uses predominantly renewable energy. (assuming the restart of QSLM).

Customers

The automobile industry has played a vital role in driving demand for primary magnesium alloys, increasing dramatically over the last 10 years. Uses include engine and gearbox casings and structural components. While the adoption of electric vehicles will reduce demand for magnesium alloys used in internal combustion engines and drive-chains, there will likely be increased demand for magnesium alloys in structural components. However, a slowdown in this industry is likely to see demand drop slightly. Europe and Japan rely on China for over 95% of primary magnesium supply[3]. Overall, China's exports have dropped dramatically as a result of the COVID-19 pandemic. Also, magnesium alloys have military applications and are pivotal to the construction of 5G Base Stations[3].

Suppliers

Following the deficits encountered in 2016-2018 caused by Chinese environmental inspections, supply recovered and a surplus was recorded in both 2019 and 2020. However, global demand has contracted due to COVID-19 implications and 2021 has recorded a supply surplus thus far.

From 2016-2021, the five-year CAGR for growth in Chinese supply is 4.9%, while for the rest of the world, the CAGR is 9.1%[4]. In 2021, ROW production is estimated at 212Kt, mainly from US (31%) and Russia (31%)[4]. Europe and Japan rely on China for more than 95% of magnesium supply however, the US imposed anti-dumping tax on Chinese magnesium products prevent the same level of dependability from occurring in the US. Also, CM's 2021 industry report, forecast China exports to increase by ~20% yoy as economies in the rest of the world recover from the pandemic.

[2] CM Group 2020 Report

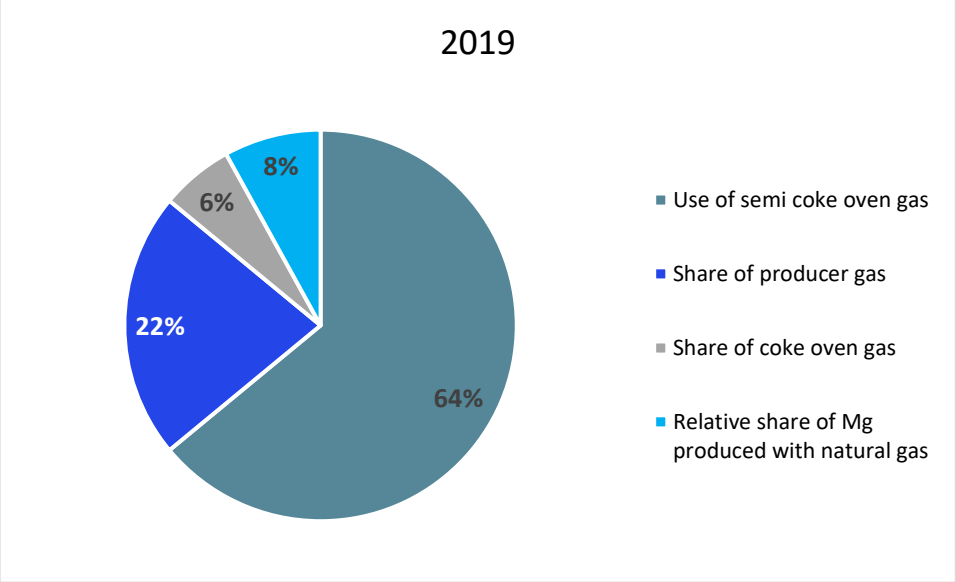
Green magnesium

MGL's Qinghai alloy processing facility sits next to one of the few magnesium plants in the world (QSLM) that is capable of producing green magnesium. QSLM has produced magnesium with 25% of the CO2 released compared with nearly all other magnesium (and is expected to do so when it restarts). As the drive to produce low-carbon products continues, we expect to see demand for "green" magnesium grow and be reflected initially in valuations and ultimately in higher prices for "green" magnesium alloys.

MGL's magnesium alloy cast house is designed to take molten magnesium directly from the QSLM's magnesium production facility. QSLM uses the electrolysis process to produce magnesium – with electricity the major source of energy for the electrolysis process. 85% of the required electricity is sourced from renewable electricity generation – hydro, solar and wind.

Sources of green magnesium are rare. The Pidgeon process dominates global production with 90% from this process. The Pidgeon processes get their energy from a number of sources with most using semi coke oven gas. While the amount of magnesium produced with natural gas (kt) has increased by 80% over the past 8 years, Pidgeon process facilities using natural gas still accounts for less than 10%.

Figure 21 – Source of energy for Pidgeon process



Source: IMA LCA Study 2020

Demand outlook for green magnesium

Once supply has restarted, MGL's Qinghai plant will be one of the few sources of green magnesium alloy. As yet, there is no consistent price premium evident for green magnesium. While we expect this to change in coming years price premiums for aluminium are likely to appear first. Magnesium continues to be a lightweight alternative to steel and aluminium providing increasing benefits in a low carbon world, particularly in the transport industry.

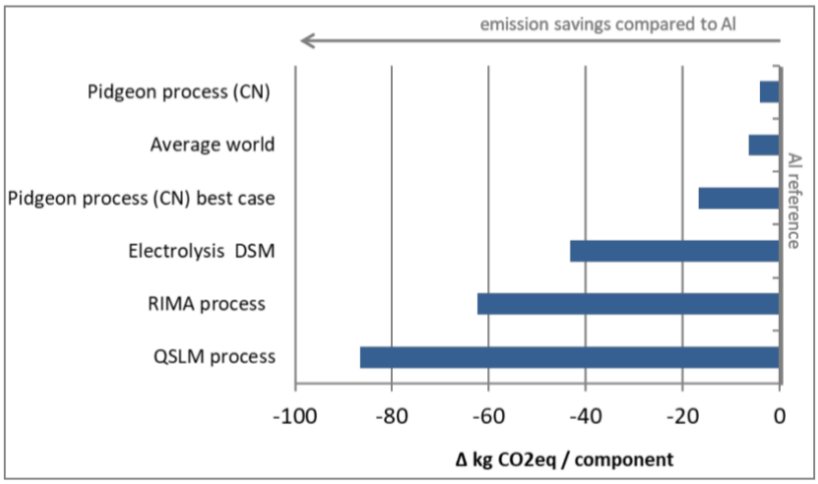
Magnesium alloy components are typically lighter than equivalent aluminium alloys and have increased penetration into the auto industry – particularly in engine and drive chain but increasingly in the structure of vehicles.

As the focus on getting to a carbon neutral world continues to build momentum, magnesium has a significant role to play in further reducing greenhouse gases by reducing the weight of vehicles and aircraft. While the contribution of magnesium to reduced carbon footprint through lower vehicle weight is important, total lifecycle analysis (TLA) must be used to consider the complete picture.

A recent report (IMA LCA Study 2020) undertook TLA case studies of magnesium and aluminium alloys in motor vehicle and aircraft frames. Note that magnesium alloys have >90% magnesium and aluminium alloys have >90% aluminium resulting in the production of the underlying metal being the dominant source of greenhouse gases. Both case studies show substantial benefits of using magnesium alloys instead of aluminium when the magnesium is produced using processes other than the Pidgeon process.

In the case of motor vehicles, alloys theoretically sourced from QSLM magnesium (MGL Qinghai's proposed source of magnesium), show a substantial TLA benefit over aluminium. This comes from lower CO2 emissions in production and a lower CO2 footprint when the vehicle is in use due to its lower weight. At the production phase, only the QSLM magnesium plant can make magnesium that produces less CO2 than aluminium production (based on the mix of aluminium from various sources used in Europe). However, once the emissions of the overall life cycle are considered, magnesium from all production scenarios show a benefit over aluminium – albeit rather small for most magnesium (given the dominance of the Pidgeon process).

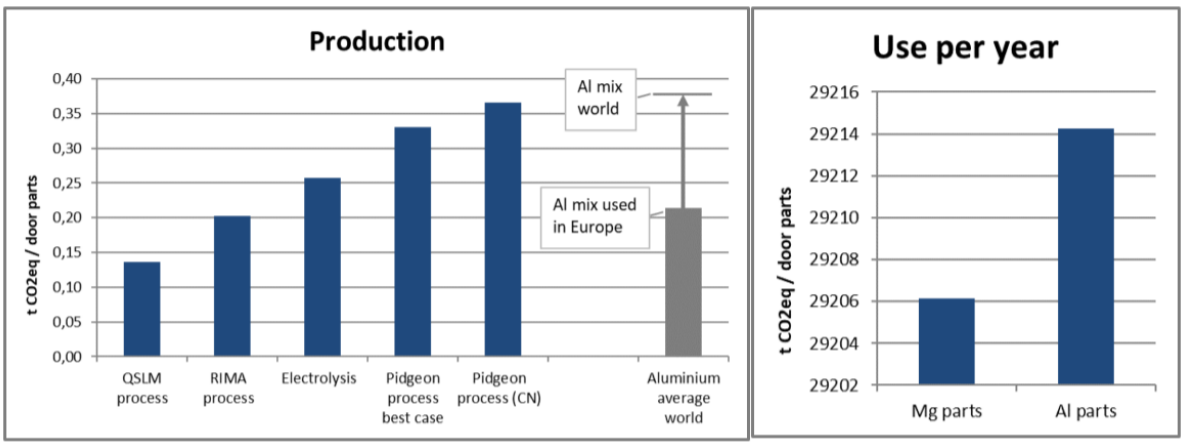
Figure 22 – Overall greenhouse gas difference between various sources of magnesium and Al



Source: IMA LCA Study 2020

The use of magnesium alloys in aircraft components shows a more dramatic benefit over aluminium. Similar to the motor vehicle case study, only the QSLM process produced less CO2 than aluminium. However, the 22% lower weight and hence fuel savings of the component considered in this case study meant that it took only a few flights to offset the higher CO2 emissions from even the Pidgeon process.

Figure 23 – Greenhouse gas emissions from production of aircraft parts (left side) compared to annual GHG emissions during aircraft operation (right side)



Source: IMA LCA Study 2020

Green aluminium – a case study for the green magnesium industry

We address this issue by first considering the aluminium industry – an industry more than 60x larger than the magnesium industry.

There appear to be only anecdotal examples of higher prices being paid for green aluminium. To date there is no separate LME price for green aluminium, but according to Reuters, various aluminium trading and information companies including, Harbour, Platts and Fastmarkets have started collecting data on green aluminium – a pre-cursor to offering pricing information on green aluminium.

Aluminium producers are now making concerted effort to identify production as green and likely one of the most significant announcements is Rusal's demerger of its high-carbon products from its greener aluminium. The Hong Kong listed Rusal is the largest aluminium producer outside of China. Expected to be completed in early 2022, the new company will be called AL+ and hold 60% of aluminium and 70% of its Alumina assets, while the remaining older assets will form a separate company that is yet to be named.

While green aluminium is yet to attract a consistent premium, green aluminium companies can get cheaper debt finance and garner more interest in the equity markets, particularly ESG funds, which will likely result in premium valuations over traditional aluminium.

Other drivers which could help valuations of green aluminium could be the carbon border-tariffs which are being mooted by European countries. This will tend to enhance the valuations of green aluminium producers until such time as manufacturers start paying premiums for green aluminium.

We expect that the evaluation of a premium for green magnesium will follow a similar trajectory to aluminium with premiums for green magnesium possibly some years off. In the meantime, expect valuations of green magnesium producers to expand relative to those of high-CO2 magnesium producers.

Valuation

We value MGL at $0.53 per share composed of $0.41 being the sum of the parts of the Anodes segment and the Recycling business that are fully operating, and $0.12 per share being an estimate of the value of the Qinghai based alloy plant at 28% capacity utilisation.

The Anodes business is valued using a discounted EV / EBITDA multiple derived from comparable companies. For simplicity and given that it is the only segment where there is identifiable positive cash flow, we have allocated all the debt to the Anodes business. A transaction-based multiple is used to estimate a value for the Recycling business.

Figure 24 – MGL Sum of the parts valuation

Business	Valuation methodology	EV ($m)	Net Debt ($m)	Equity val. ($m)	per share ($)
Anodes	EV / EBITDA multiple (disc comps)	28.0	5.1	22.9	$0.28
Recycling	Capacity multiple (recent txn)	11.0		11.0	$0.13
Total	**(fully operating busineses)**	**39.0**	**5.1**	**33.9**	**$0.41**
Qinghai	EV / EBITDA at 28% capacity util.	10.0		10.0	$0.12
TOTAL		**49.0**	5.1	43.9	**$0.53**

Source: Company, MST Access

If Qinghai were to achieve 75% capacity utilisation, our valuation would increase to $1.44. We note the risk that QSLM may not supply magnesium as contracted (and may therefore be in breach of its agreement) and MGL's Qinghai may not become economic may therefore be forced to close. It is unclear the nature of any recourse that MGL may have. We note that QSLM owns 29% of the equity in MGL.

Note that MGL is a processor of magnesium, so the recent price increase of the metal has no meaningful impact on our valuation.

Anodes (Cathodic Corrosion Protection segment)

MGL generates solid earnings from its niche anode products sold into the OEM white goods industry. US expansion provides substantial upside for the Anodes segment with plans to expand into this region over coming years. We have not specifically forecast the potential upside from this expansion. We expect that over coming years, sustainability trends will drive above market demand for MGL's high margin electronic anodes, but these have not been explicitly forecast.

We forecast the Anodes segment to broadly maintain the trends of the past four years.

MGL's strong 1H21 results for the Anodes business were largely a result of favourable commodity prices. While the strong magnesium prices will drive revenues, they will not have a significant effect on medium term earnings. There is some risk of increased volatility in the short term due to the timing of cost pass-throughs in contracts, and the competitive environment is particular markets.

Figure 25 – Anode business historical and forecast estimates of revenue and EBITDA

	2017	2018	2019	2020	2021E	2022E	2023E	2024E	2025E	2026E
Magnesium price (USD)	2,181	2,481	2,289	1,952	4,000	3,000	2,500	2,250	2,250	2,250
Magnesium anode volumes (t)	1,860	2,065	2,594	3,038	3,403	3,811	4,268	4,780	5,354	5,996
... growth	*0%*	*11%*	*26%*	*17%*	*12%*	*12%*	*12%*	*12%*	*12%*	*12%*
Revenue (incl Mg and electronic anodes)	**22.7**	**27.0**	**30.7**	**31.4**	**43.2**	**43.5**	**46.0**	**49.6**	**55.4**	**61.3**
... growth		*19%*	*14%*	*2%*	*38%*	*1%*	*6%*	*8%*	*12%*	*11%*
Gross Profit	7.2	8.8	7.9	8.2	10.6	11.8	13.2	14.7	16.5	18.2
....GPM	*32%*	*33%*	*26%*	*26%*	*25%*	*27%*	*29%*	*30%*	*30%*	*30%*
Overheads	-4.4	-5.1	-5.4	-4.9	-5.8	-5.8	-5.8	-5.8	-5.8	-5.8
EBITDA	**2.8**	**3.7**	**2.5**	**3.3**	**4.8**	**6.0**	**7.4**	**8.9**	**10.7**	**12.4**

Source: Company, MST Access

We estimate the value of the Anodes business by considering EBITDA multiples of similar business.

Figure 26 – Comparable companies

Valuation		Price (?)	MCAP (AUD)	EV (AUD)	EBITDA Margin 2019	EBITDA Margin 2020	EV / EBITDA 2019	EV / EBITDA 2020	Price / Earnings 2019	Price / Earnings 2020	Net Debt / EBITDA 2019	Net Debt / EBITDA 2020
SGM-AU	Sims	12.72	2,542	2,819	5.5%	3.0%	7.8x	19.5x	16.1x	-	-1.0x	-0.8x
UMI-BE	Umicore	49.81	19,408	20,705	22.4%	24.8%	17.4x	16.3x	38.3x	37.2x	1.9x	1.8x
600459-CN	Sino-Platinum Metals	22.58	2,752	3,570	2.4%	2.2%	32.3x	26.4x	55.4x	39.1x	-	-
DBG-FR	Derichebourg	9.58	2,414	2,911	7.1%	7.3%	9.7x	10.2x	27.1x	71.3x	0.7x	1.9x
SCHN-US	Schnitzer Steel Inds	48.47	1,825	2,183	6.6%	7.8%	11.4x	12.0x	22.4x	112.7x	0.7x	-
7456-JP	Matsuda Sangyo Co., Ltd.	2812.00	997	914	-	-	-	-	18.3x	12.1x	-	-
ERA-FR	Eramet	67.40	2,839	5,181	17.2%	11.2%	5.2x	8.2x	-	-	2.1x	3.4x
RS-US	Reliance Steel & Aluminum	142.66	12,388	13,902	11.2%	10.8%	8.3x	10.8x	13.8x	18.5x	1.2x	1.2x
AGS-DE	Allgemeine Gold- und Silbe	132.00	-	993	-	-	-	-	-	-	-	-
Mean					**10%**	**10%**	**13.1**	**14.8**	**27.3**	**48.5**	**0.9**	**1.5**
Median					**7%**	**8%**	**9.7**	**12.0**	**22.4**	**38.2**	**0.9**	**1.8**

Source: MST Access, FactSet

Taking the median value of 12x, we discount that by 30% to reflect the additional risk in businesses of the size of MGL. This determines an EV of the Anodes business of $28m.

Figure 27 – Valuation of the Anodes business based on discounted comparable company EV / EBITDA multiple

EV / EBITDA		2020
Comparable companies - median	x	12.0
Discount for company size	%	30%
EV / EBITDA multiple for Anodes	A$m	8.4
FY20 EBITDA	A$m	3.3
EV	A$m	28.0

Source: MST Access

Recycling

The recycling business is part of the Metals segment and we do not have separate financial information for it. Management has informed the market that the profitability of the recycling business is linked to the supply of primary magnesium alloys. When QSLM restarts and the supply of primary magnesium alloy from Qinghai to Europe increases, it is expected that recycling profitability will increase. However, this is unlikely to be obvious in the financial information given that both Qinghai and Recycling are in the Metals segment.

From a valuation perspective, however, there was a recent sale that provides a valuable comparison. In the first half of 2019, Luxfer Holdings Plc sold its 100% owned Czech Republic based magnesium alloy recycling business, Magnesium Electron CZ s.r.o for an enterprise value of US$4.4m. With production capacity of 12,000 tpa, the sale price translates to US$367 / tonne of annual capacity. It was renamed Crown Metals CZ and we understand that the ultimate owner is Regal Metal, a Shanxi, China based magnesium and aluminium alloy producer.

We have not applied a premium or discount to the multiple at which Crown Metals was transacted but note that MGL's recycling have an aggregate capacity of nearly double Crown Metals. We also consider that the attractive environmental characteristics of recycled magnesium alloys is likely to result in relative premiums over time.

Figure 28 – Valuation of the Recycling business

Crown Metals transaction		
Annual production capacity	k tpa	12
Purchase price	USD	4.4
Purchase price	A$,000	6.6
Capacity multiple	A$ / tpa	550
Implied valuation for MGL's recycling business		
MGL combined recycling capacity	k tpa	20
Value of MGL's recycling business	**A$m**	**11.0**

Source: MST Access, Luxfer Holdings Plc

MGL Qinghai

The forecast re-commencement of just one of the six dehydration lines at MGL Qinghai's magnesium supplier, QSLM, would completely transform MGL Qinghai's volume throughput, revenue and gross profit. The re-start of QSLM is proposed for the first half of 2022, although there have been considerable delays and therefore we think there is some uncertainty around its timing. For the purposes of our earnings forecasts, we assume that the QSLM starts supplying magnesium in the second half of 2022, reaching 10,000 tonnes in 2023.

We base our valuation of MGL Qinghai on receiving molten magnesium metal from one of QSLM's dehydration lines. Each dehydration line is expected to result in the production of 16,600 tonnes of magnesium metal. While at 100% conversion, MGL Qinghai would produce more than 16,600 tonnes of magnesium alloy (other metals account for between 5 – 8% of total volume in the alloys that Qinghai produces), we have allowed for some slippage. This equates to MGL Qinghai operating at 28% capacity utilisation.

At 16,600 tonnes of alloy production, we estimate that Qinghai would generate EBITDA of $1.2m and applying the same earnings multiple applied to the anodes business would contribute $10m of value to MGL. Note that the scenarios in the following table do not include revenue as our estimate of earnings are based on volume of tonnes processed, not the price of the magnesium. The purchase and supply agreement between QSLM and MGL Qinghai effectively provides MGL Qinghai with a conversion margin per tonne of magnesium purchased from QSLM. We estimate that MGL Qinghai will generate an average gross margin of RMB1,500 per tonne of magnesium alloy produced.

Figure 29 – Valuation scenarios of MGL's Qinghai alloys business

Volume of Mg alloy produced		5,000	10,000	16,600	30,000	45,000	60,000
Conversion margin	(RMB / t)	1,500	1,500	1,500	1,500	1,500	1,500
Conversion margin	(AUD/ t)	313	313	313	313	313	313
Conversion margin	(A$m)	1.6	3.1	5.2	9.4	14.1	18.8
Overheads	(A$m)	4.0	4.0	4.0	4.0	4.0	4.0
EBITDA	**(A$m)**	**-2.4**	**-0.9**	**1.2**	**5.4**	**10.1**	**14.8**
Applicable EV / EBITDA multiple	x	8.4					
EV of Qinghai	(A$m)	0.0	0.0	10.0	45.2	84.5	123.9
Equity value per share	**(A$)**	**0.00**	**0.00**	**0.12**	**0.55**	**1.03**	**1.51**

Source: MST Access

Our analysis assumes that QSLM re-starts production of magnesium in 2022, and the liquid metal starts being delivered to MGL Qinghai's cast-house in the second half of 2022. Should QSLM fail to deliver molten magnesium to MGL Qinghai, then at some point in the future, we would expect QSLM may be in breach of its agreement. It is not clear what recourse MGL might have to QSLM, however, we note that QSLM owns 29% of the equity of MGL.

Environmental, Social and Governance (ESG)

Environmental

MGL's manufacturing and recycling facilities are based in Germany, Romania and China. One would expect that its European plants would be held to the typically high European environmental standards.

MGL's Qinghai magnesium cast house is less than five years old and situated next to a new electrolysis-based magnesium production plant that is of a similar age. Its recent construction means that it is likely to meet high environmental standards.

Once fully operational, MGL's Qinghai plant will likely produce magnesium alloy with a lower carbon footprint than any other producer and generate about one quarter of the CO2 (per tonne of magnesium metal) than the Pidgeon process – which accounts for ~90% of all production.

Social

MGL's code of conduct sets out a strong ethical and legal framework and can be accessed via the Corporate Governance section of the Company website.

The Company has a zero-tolerance policy towards forced or child labour and does not permit the use of conflict materials in its supply chain. MGL has a Whistleblower Policy that effectively allows them to detect corrupt, illegal or undesirable conduct at the Company. The Company has policies on occupational health and safety and employs 330 people. While the company does not consistently publish comparable safety statistics, key management worked with Norsk Hydro prior to the assets being acquired by Qinghai assets being acquired by MGL.

Governance

As is often the case with companies of this size, the CEO is also the Executive Chairman.

The major shareholder, QSLM, holds 29% of the shares on issue, and is the major supplier (once its magnesium plant is operational), and has a Director on the Board. QSLM's parent was originally Qinghai Salt Lake Industry Co Ltd (QSLIC) but an 88% share of QSLM was bought in late 2019 by Qinghai Huixin Asset Management – ultimately owned by entities controlled by the Government.

MGL has policies on anti-bribery and corruption, ensuring that it conducts all business in accordance with the applicable laws in the jurisdictions in which it operates. This policy applies to MGL and all its subsidiaries (directors, officers, employees, and third parties engaged by MGL).

Executive remuneration has the usual three components: base, cash short term incentive, and performance rights based long term incentive (LTI). Hurdles for the LTI include total shareholder return (TSR) targets that are measured each year with the issues of the performance rights over a three year period from the date on which they were granted.

Risks

Key risks to our forecasts and valuation include:

- Failure of the Qinghai cast house to receive the planned magnesium metal
    - QSLM magnesium production does not restart or does not produce the contracted level of magnesium metal
    - The problems with trucks used to deliver the metal from QSLM to MGL's cast house remain unresolved (notwithstanding that there has been more than sufficient time to fix the problem.
    - QSLM divert the magnesium to other customers to an extent that is breach of the agreement
- MGL loses its licence to operate in the Qinghai province
- Unforeseen operational (including safety) problems at Qinghai, or indeed any of its other processing plants in China, Germany and Romania
- A dramatic deterioration in the competitive environment one or more of its markets
- A loss of access to capital which is particularly important to fund working capital which increases in line with sharply rising magnesium prices
- We may have underestimated the extent to which demand for structural magnesium in vehicles will offset the decline in demand for magnesium used in engines and drive chains as electric vehicles replace internal combustion engines
- We may have over-estimated the long-term demand for "green" magnesium from the transport industry

Appendix 1 - Management

The Executive Chairman brings extensive financial experience and business acumen to his role with more than a decade running the company. Management has extensive operational and market knowledge across the regions where MGL is located with the key operational managers, Klein-Schmeink and Tong, having been with MGL for more than 20 years and 18 years respectively.

Nicholas Andrews – Executive Chairman

Mr Andrews has been the Executive Chairman of MGL since November 2009. Andrews has an outstanding financial services background in funds management and investment banking. He served as Managing Director at UBS for nine years where he headed the global distribution of Australian and New Zealand equity products. Andrews is also a Vice President of the International Magnesium Association.

Christoph Klein-Schmeink – President Magontec Europe, North America and Middle East

Mr Klein-Schmeink has been involved with MGL for over 20 years. He previously was Head of Sales and Marketing and Vice President of Global Sales and Marketing for MGL and Sales and Marketing Manager for Norsk Hydro when it owned assets that are now owned MGL.

Tong Xunyou – President Magontec Asia

Mr Tong joined MGL in 2003 and has held various roles including Production Manager, Finance Manager and Deputy General Manager and General Manager of China. Mr Tong holds a bachelor's degree in Chemistry from Dalian University of Science and Engineering and an MBA from Hong Kong Polytechnic University. He is responsible for the sale of magnesium alloys and anodes produced in the Chinese factories.

Derryn Chin – Chief Financial Officer

Mr Chin joined MGL in 2014 and was appointed CFO in 2016. Chin is a Chartered Accountant, CFA charter holder, speaks Mandarin. Prior to 2014, he was equity research analyst at Macquarie Group in Australia before which he held audit and financial advisory roles at KPMG. Chin holds a Bachelor of Commerce (Accounting and Finance) degree from University of New South Wales.

Appendix 2 - Board

Nicholas Andrews – Executive Chairman

See above.

Xie Kangmin – Non-Executive Director

Member of the Finance & Audit Committee
Mr Xie is the current President of Qinghai Salt Lake Magnesium Co. Ltd (QSLM) and has been an employee of the QLSM group of companies since 1984. Xie is a Senior Engineer and holds a Bachelor of Engineering (Mining) degree from Chongqing University.

Andre Labuschagne – Non-Executive Director

Member of the Finance & Audit Committee
Mr Labuschagne is the Executive Chairman of Aeris Resources Limited (formerly Straits Resources Limited) which holds 12.9% of MGL stock. Labuschagne has over 25 years' experience in the mining industry and has held a variety of senior executive positions.

Li Zhongjun – Non-Executive Director

Member of the Remuneration & Appointments Committee
Mr Li is the owner of Tianjin Keweier Metal Material Co Ltd in China. Li has built crucial relationships with key automotive industry bodies over his 10 year stint at Tianjin Auto Industry Company Ltd. Li also has over 10 years of experience with trading and manufacturing businesses that specialise in magnesium products.

Atul Malhotra – Independent Director

Chairman of the Finance & Audit Committee, Member of the Remuneration & Appointments Committee
Mr Malhotra has over 40 years' experience in Procurement, Supply Management, Strategy, Business Development and other functions. Malhotra has also held co-responsibility for providing strategic direction to, and oversight of, the business units with reporting responsibilities to the Corporate division. He has been acting as an independent adviser to various corporate clients and businesses since 2014.

Robert Kaye SC – Independent Director

Chairman of the Remuneration & Appointments Committee
Mr Kaye provides a strong legal background and has been involved in various commercial matters both advisory and litigious in nature and served on a number of NSW Bar Association committees including Professional Conduct Committee. He also has outstanding mediation experience and been involved in the successful resolution of complex commercial disputes.

Li Shun – Alternate Non-Executive Director

Mr Shun holds an Accounting degree and is a qualified intermediate accountant. Shun is currently the Section Head of Securities Affairs and the Securities Affairs Representative at QSLI.

Appendix 3 – Remuneration Structure

Given the size of the Company and lack of resources, MGL has ensured their remuneration structure is simple. Also, non-cash mechanisms are confined to shares and options. The Company defines Key Management Personnel as Directors, the Executive Chairman, and full-time employees with direct reporting responsibility to the Executive Chairman (except for the Company Secretary). There are three usual components of remuneration of Key Management Personnel: base or fixed remuneration; short-term incentive (STI) in the form of cash; and a long-term incentive (LTI) in the form of performance rights.

Fixed Cash Remuneration

The Company's executive contracts of employment comprise post-employment benefits (superannuation and other social benefits for Chinese personnel). However, the contracts do not include any guaranteed base salary increases. These contracts are assessed on a periodic basis with the assistance of external consultants where deemed necessary. In 2020 MGL did not engage the services of independent remuneration consultants.

Executive STI Plan

The STI plan rewards executives according to a set formula with reference to group probability and are 100% cash settled. The Board are responsible for determining the size of the pool and actual financial metrics relative to MGL's budget are factored into the amount. The Board also has discretion to adjust these payments depending on the particular circumstances of the Group and other qualitative factors as it sees fit.

Executive LTI Plan

MGL's LTI's are issued in the form of performance rights to the global management group and provide for vesting into ordinary shares. The performance rights are subject to the achievement of pre-determined share price targets in the first instance. The LTI plan uses absolute total shareholder return (TSR) as the basis for performance measurement targets based on the 30-day VWAP for each year ended 31 December. TSR comprises the percentage change in the Company's share price, plus the value of any future dividends during the period and is measured over a 3-year period.

Appendix 4 – Major shareholders

MGL has three substantial shareholders:

- Qinghai Salt Lake Magnesium Co. Ltd (QSLM): 28.7%
- Allan Gray Australia Pty Limited: 13.9%
- Straits Mine Management Pty Ltd: 12.9%

MGL and QSLM maintain a relationship that is crucial to the operations of MGL's magnesium alloy cast house business. Previously a subsidiary of Qinghai Salt Lake Industry Co. Limited, QSLM is now a subsidiary of Qinghai Huixin Asset Management. The two parties hold an operating agreement, an off-take price agreement and a lease agreement. These agreements provide MGL with a 10 + 10-year lease and the exclusive right to manufacture all types of magnesium alloy at the QSLMs Qinghai facility.

Australian Fund Manager, Allan Gray, has previously acted as joint sub-underwriter for some of MGL's capital raises. Allan Gray was established in 2005 and has been investing in Australia for over 15 years. Also, their broader group has been investing globally for over 45 years.

Aeris Resources Ltd wholly owned subsidiary Straits Mine Management is a substantial shareholder of MGL. Also, Aeris' Executive Chairman Andre Labuschagne is a Non-Executive Director of MGL.

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